

NETTUR TECHNICAL TRAINING FOUNDATION
DIPLOMA IN MECHATRONICS ENGINEERING & SMART FACTORY – CP15
IV SEMESTER REGULAR & SUPPLEMENTARY EXAMINATION-JULY 2023

Subject: Applied Mechanics

Total Time: 2 Hr.

Subject Code: CP15406T

Total Marks: 50

PART B

1.0 ANSWER ANY EIGHT OF THE FOLLOWING

2*8=16

- 1.1 State Theorem of Perpendicular Axis
- 1.2 What you mean by a Beam, Where it is mainly used?
- 1.3 What do you mean by Continuous Beam?
- 1.4 What do you mean by Elastic Limit?
- 1.5 A steel rod 120mm diameter is subjected to an axial pull of 60KN. Find the stress induced in the steel bar
- 1.6 Define Pure Torsion
- 1.7 What is turntable?
- 1.8 What are the types of hoist devices?
- 1.9 What is tractor trailer?
- 1.10 What do you mean by factor of safety?

2.0 ANSWER ANY SIX OF THE FOLLOWING

3*6=18

- 2.1 Find the moment of inertia of a circular section of a 50 mm diameter about an axis passing through its center
- 2.2 Write the classification of beams with simple sketches.
- 2.3 Define Point load with neat diagram
- 2.4 What do you mean by shear force and bending moment?
- 2.5 Explain Load – Deformation Relationship
- 2.6 Write the Differences between a Column and Strut
- 2.7 Explain Hoop Stress (or) Circumferential stress, and Longitudinal Stress
- 2.8 What is the principle used in roller conveyor?

3.0 ANSWER ANY FOUR OF THE FOLLOWING

4*4=16

- 3.1 Write the effect of load on elastic materials
- 3.2 Write down the assumptions made in the Euler's theory of columns
- 3.3 Explain about the types of springs
- 3.4 Explain Chute conveyor with a neat sketch.
- 3.5 Explain the Theory of Simple Bending
- 3.6 Write down the types of end conditions of columns

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Subject: Control System

Subject Code: CP150401

Time: 2 Hr.

Marks: 50

PART B

1.0 ANSWER ANY EIGHT OF THE FOLLOWING

2*8=16

- 1.1 What is disturbance in a control system?
- 1.2 Explain the needs for modulation
- 1.3 What is root locus analysis?
- 1.4 What do you mean by plant in control system?
- 1.5 Draw the block diagram of control system
- 1.6 What is the difference between synchro transmitter and synchro control transformer?
- 1.7 Define the term controller
- 1.8 What do you mean by Index of performance (IP)?
- 1.9 Define Order of a system
- 1.10 What are the basic building blocks of mechanical rotational systems?

2.0 ANSWER ANY SIX OF THE FOLLOWING

3*6=18

- 2.1 Sketch the block diagram a communication system.
- 2.2 List the Properties of a proportional controller.
- 2.3 Depending on the damping ratio how we can classify systems?
- 2.4 Compare open loop system and close loop system.
- 2.5 What are the advantages of frequency response over time response analysis?
- 2.6 Explain how a potentiometer can be used as error detector?
- 2.7 Write short notes on frequency modulation
- 2.8 Compare gain margin and phase margin

3.0 ANSWER ANY FOUR OF THE FOLLOWING

4*4=16

- 3.1 Write short notes on the basic components of control system
- 3.2 Briefly explain about test signals in control system
- 3.3 Write short notes on Armature Controlled DC Motor
- 3.4 Explain briefly supervisory computer control
- 3.5 Describe the five rules of block diagram reduction
- 3.6 Briefly explain about the feed water control process

